

Delayed Diagnosis

Orbital complications of sinusitis: avoid delays in diagnosis

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Summary: Orbital cellulitis and abscess formation are uncommon complications of sinusitis. Early diagnosis and treatment are important to prevent blindness and intracranial complications. We present four consecutive cases referred over 2 years which demonstrate how diagnostic delays may occur and suggest a protocol to avoid similar delays.

Introduction

The orbital complications of sinusitis including cellulitis and abscess formation are well documented in both children and adults, but remain relatively uncommon. Because other symptoms and signs of acute sinusitis may be absent, delays in diagnosis and treatment can occur and may result in blindness or intracranial complications. We describe four consecutive referrals over a 2 year period. There was a delay in making the correct diagnosis in all four cases and in one instance (case 2) this delay probably contributed to a subsequent loss of vision. We discuss the investigation and management of the orbital complications of sinusitis.

Case reports

Case 1

A 38 year old man presented following a generalised seizure. He had a 2 day history of headache and a one day history of right-sided proptosis, but no other symptoms suggestive of sinusitis. A brain computed tomographic (CT) scan showed no intracranial lesion but did not demonstrate the sinuses. A lumbar puncture showed a minimally raised cerebrospinal fluid protein and white cell count. The patient was started on intravenous penicillin, cefotaxime and phenytoin. The following day he was fully alert and afebrile but his proptosis was more severe with periorbital swelling. Vision in the

eye was 6/24. Because he was afebrile it was felt orbital cellulitis was unlikely. The same treatment was maintained for a further 24 h without improvement. CT scans of his orbits and, following an otolaryngological opinion, sinuses, were then obtained which demonstrated a right maxillary, frontal and ethmoid sinusitis and orbital abscess. Surgical drainage of the sinuses and orbital abscess was performed, and intravenous metronidazole added to the antibiotic regime. The patient went on to make a full recovery with no impairment of vision.

Case 2

A 66 year old man presented to his general practitioner with a 2 day history of left orbital pain and periorbital swelling. There were no other symptoms to suggest sinusitis. He was treated with an oral cephalosporin. After 2 days his symptoms had become worse and he was referred for an ophthalmological opinion. At this time he was unable to perceive light in the eye and there was proptosis, reduced eye movements and an absent pupillary light response on the left. A diagnosis of orbital cellulitis was made and he was started on intravenous ampicillin and flucloxacillin. This treatment was maintained with little improvement for 3 days. A sinus X-ray demonstrated a left maxillary fluid level and, following an otolaryngological referral, a CT scan was performed which demonstrated a pansinusitis and left orbital abscess. Surgical drainage of the sinuses and abscess was performed, and metronidazole was added to the intravenous regime. The infection resolved within days but the sight in the eye did not recover.

Case 3

A 9 year old boy presented with a 3 day history of left orbital pain and a 12 hour history of proptosis and periorbital swelling. His vision was normal. He was pyrexial but had no other symptoms or signs of sinusitis. He was admitted and treated with intravenous flucloxacillin and ampicillin. Over the next 3 days his pyrexia settled but the eye signs showed little improvement. Sinus X-rays and a CT scan at this time showed inflammation in the left ethmoid sinuses and left periorbital swelling. The ethmoids were drained through an external approach and the proptosis and periorbital oedema settled within 48 hours. There were no residual visual problems.

Case 4

A 21 year old intravenous drug abuser presented with a one week history of right orbital swelling and pyrexia. Shortly before the onset of symptoms he had received a minor right-sided head injury. An ophthalmologist found normal vision and only slight periorbital oedema which was thought to be secondary to the trauma. He was discharged but returned after 2 weeks as his symptoms had gradually worsened. At that time he had an obvious right periorbital cellulitis. A CT scan confirmed right frontal and ethmoidal sinusitis. He was commenced on intravenous ampicillin, flucloxacillin and metronidazole, and the sinuses were surgically drained. He made an uneventful recovery with no loss of vision.

Discussion

In all the cases described here there was a delay in diagnosing the underlying sinusitis which was causing orbital inflammation. Acute orbital inflammation is secondary to sinusitis in around 70% of cases^{1,2} and the maxillary, ethmoid and frontal sinuses may all be involved.³ Current grading systems divide orbital inflammation secondary to sinusitis into five stages: I, preseptal (periorbital)

cellulitis; II, subperiosteal abscess; III, orbital cellulitis; IV, orbital abscess; V, cavernous sinus thrombosis.^{1,4} Early treatment is required to prevent progression from stage 1 to the later stages which may result in blindness, intracranial complications and death.⁵ Whilst sinus X-rays alone adequately demonstrate frontal and maxillary sinus sepsis, ethmoid disease may be more difficult to interpret. CT scanning of the sinuses and orbits allows accurate localization of the sinus infection and usually enables an accurate grading of the orbital inflammation.⁶ All the cases reported here would have been accurately diagnosed without delay if CT scans had been obtained at an early stage.

Medical treatment should be commenced as soon as the diagnosis is suspected. Appropriate antibiotics should be given intravenously. In children aerobic organisms including *Haemophilus influenzae*, streptococci and staphylococci are the most common pathogens whilst in adults both aerobic and anaerobic organisms are important.^{2,7,8} In children ampicillin and flucloxacillin is one suitable regime² whilst in adults additional anaerobic cover should be provided with metronidazole.⁷ Surgical drainage of sinus infection is recommended if stage I disease does not respond within 24–48 hours. In more severe disease, although many cases will respond to medical treatment alone, a case can be made for sinus drainage within the first 24 hours to minimize the risk of visual loss and intracranial complications. Orbital abscesses should be drained without delay.^{2,5,9} Even if visual loss has already occurred, immediate surgical decompression of the orbit can restore sight.¹⁰

Delays in accurately diagnosing the cause of an acute orbit and giving adequate medical and surgical treatment may allow a progression of disease to an irreversible stage with resulting blindness. We therefore recommend that all patients presenting with either headache or pyrexia combined with symptoms or signs of orbital inflammation should undergo orbital and sinus CT scanning without delay.

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